

# CLEANING DEVICE, ESPECIALLY FOR CLEANING WINDOWS

## BACKGROUND OF THE INVENTION

The present invention relates to a cleaning device which has a squeegee in a mount and a stemlike handle joined rotatably to the mount via a pivot axis. One such cleaning device is described in German Utility Model DE U 87 03 924.9.

In the cleaning device of DE U 87 03 924.9 - as in other conventional cleaning devices of this type - the mount that receives the squeegee is disposed at a right angle to the handle, for ease of use in the case where the person using the device is placed more or less frontally in front of the region of the window or other surface to be cleaned. In such a case, the person using the device can clean the window or the like in a simple way in strips from top to bottom. Conversely, if the person using the device is forced to place himself laterally with respect to the window or other surface to be cleaned, or if such a placement is expedient for other reasons, then the mount can be

pivoted relative to the handle and adjusted to an angle such that the window can be cleaned relatively conveniently in strips from top to bottom.

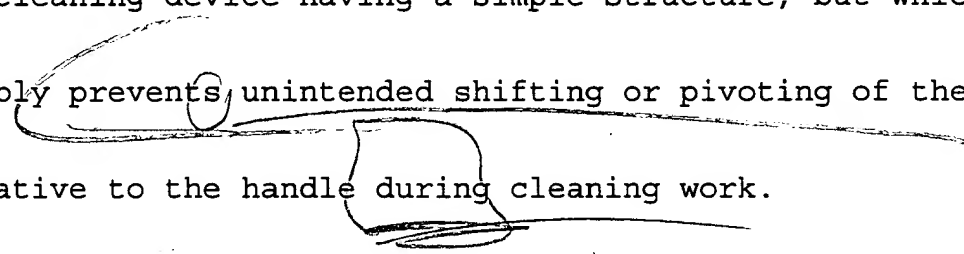
Since the position of the mount relative to the handle, once set, does not change unintentionally while cleaning is being performed, clamping occurs in the form of a certain sluggishness of the two elements relative to one another, in the pivoting range between the mount and the handle.

However, the aforementioned clamping, which is also intended to assure relatively convenient adjustability of the pivot angle between the mount and the handle, is often inadequate, and as a consequence the mount may shift/pivot unintentionally and uncontrollably relative to the handle while cleaning is being performed. To overcome this disadvantage, in DE U 87 03 924.9, it is proposed that a curved set of teeth be provided on the end of the mount toward the handle. The curved set of teeth, which include both coarse and fine teeth, are

associated with a locking lever that is resiliently guided in the handle. This structure, however, is quite complicated and expensive in terms of production.

#### OBJECT OF THE INVENTION

5           The object of the present invention is to provide an improved cleaning device having a simple structure, but which can reliably prevents unintended shifting or pivoting of the mount relative to the handle during cleaning work.



#### SUMMARY OF THE INVENTION

10           To attain the object described above, according to the cleaning device of the present invention, the pivot axis of the mount and the handle forms an acute angle with a longitudinal direction of the handle that substantially deviates from a right angle. This feature makes it possible, by means of an extremely  
15           simple structural change from conventional versions, to create a

cleaning device which meets the aforementioned demands in terms of stability of the mutual position, once set, of the mount and handle, and which furthermore can be produced more economically than the cleaning device of DE U 87 03 924.9.

5            Preferably, the acute angle formed between the pivot axis and the longitudinal direction of the handle is approximately 15 to 75°, and more preferably the acute angle is approximately 30 to 60°. The acute angle may, for example, be approximately 45°.

#### BRIEF DESCRIPTION OF THE DRAWINGS

10           The invention will be described in further detail below in terms of an exemplary embodiment in conjunction with the drawings, in which:

Fig. 1 shows a side view of a cleaning device of the invention; and

15           Fig. 2 shows a plan view of the cleaning device of the invention.

## DETAILED DESCRIPTION

As shown in Figs. 1 and 2, the cleaning device 1 of the present invention substantially comprises a mount 2, with a squeegee 3 made of rubber or a similar elastic material, and a handle 4. The handle 4 is hollow, and on its end remote from the mount 2, it can be prepared or dimensioned to receive an extension member or the like.

In Fig. 1, the handle 4 is shown in a "normal position" in a direction extending crosswise to the squeegee 3, and also in dashed lines in a direction extending at an acute angle to the squeegee - i.e., more or less obliquely to the squeegee 3.

The squeegee 3 is retained in a manner known per se in a profiled rail 5, which is preferably of a metal such as aluminum, while the rail 5 is retained centrally by the receiving bearing 6 of the mount 2. A fixation screw 7 is used to fix the rail 5 with the squeegee 3 to the receiving bearing 6.

On the side opposite the receiving bearing 6, the mount 2 is joined to the end 10 of the handle 4 by means of a screw bolt 8 and a screw nut 9. This screw connection is adjusted or can be adjusted in such a way that a certain desired clamping is achieved between opposed regions 11 and 12, which thus contact one another with a certain mutual frictional engagement, of the mount 2 and the handle 4, respectively. These regions are located in a pivoting plane 13 which extends perpendicular to a common pivot axis 14 of the mount 2 and handle 4, with the pivot axis 14 being determined by the location of the aforementioned screw connection 8, 9.

According to the present invention, the pivot axis 14 of the mount 2 and handle 4 forms an acute angle  $\alpha$  with the longitudinal direction of the handle 4 that substantially deviates from a right angle. The acute angle  $\alpha$  is preferably approximately 15 to 75°, and more preferably approximately 30 to 60°. As shown in Fig. 1, for example, the acute angle  $\alpha$  is

approximately 45°. An acute angle  $\alpha$  of approximately 30 to 60° is preferred in view of the requirements, to be adapted to one another, on the one hand of the greatest attainable lateral pivoting of the handle relative to the mount and on the other hand, the least possible "displacement" of the handle in the direction of the (window) surface to be cleaned.

Alternatively, instead of locating the pivot axis 14 as shown in Fig. 1, it is also possible for the pivot axis to have a location rotated approximately 90°, with a correspondingly altered location of the pivoting plane 13. However, the embodiment shown in Fig. 1 provides a structurally simpler configuration.

By so locating the pivot axis 14 of the mount 2 and handle 4 as shown in Fig. 1, or by providing the correspondingly altered location of the pivoting plane 13, an unintended or uncontrolled shifting/pivoting of the mount 2 can be prevented during use of the cleaning device of the present invention.

In the conventional cleaning device described in the  
Background of the Invention above, by comparison, the applicable  
angle is a right angle or at least approximately a right angle.  
That is, in the conventional cleaning device, the longitudinal  
5 direction of the handle extends parallel to or at least  
approximately parallel to the common pivoting plane of the mount  
and the handle. As a result, the position of the mount is  
unstable, and this may lead to unintended shifting/pivoting of  
the mount during use.

10 The choice of location of the pivot axis 14 as shown in  
Fig. 1 results in a pivoting plane of the mount 2 and handle 4  
whose geometric line of intersection 15 is located close to - and  
parallel to - the squeegee 3 on the (window) surface 17 to be  
cleaned. In such a case, the arrangement is then preferably made  
15 such that in terms of the pulling direction 16 of the cleaning  
device 1, this geometric line of intersection 15 is located  
upstream of the squeegee 3, or of the bearing face 18 of the



squeegee 3, on the (window) surface 17. This means that the  
squeegee 3 "lags behind" the pivoting plane 13 - that is, the  
plane of action of the forces or moments to be transmitted by the  
user's hand to the squeegee 3 via the handle 4 - thus further  
5 improving the stability of whatever the established position of  
the mount 2 is at the time. And in the case of the  
aforementioned location of the pivot axis or pivoting plane being  
rotated by about 90° from what is shown in Fig. 1, such "lagging"  
also automatically occurs.

10" Finally, it is noted that an additional improvement is  
offered by the possibility of providing the handle with a non-  
round cross section, in order to ensure good non-positive  
engagement between the user's hand and the handle.